

**CLAIMS**

1. Bioreactor for culturing living cells in a liquid culture medium comprising:
  - at least one stationary tank enclosing the cells and liquid culture medium, and
  - 5 - at least one means for introducing single large gas bubbles at the bottom of the vessel, wherein the single large bubble width represents from 50 to 99% of the tank width, preferably from 60 to 99%, more preferably 98,5%.
- 10 2. Bioreactor according to claim 1 wherein the single large bubble has a volume of at least 65 cm<sup>3</sup>
3. Bioreactor according to claims 1 and 2, wherein the bioreactor also comprises at least a means for programming volume and frequency of large bubbles.
- 15 4. Bioreactor according to claims 1 to 3, wherein the tank is a flexible or non flexible plastic bag.
5. Bioreactor according to claims 1 to 4, wherein the stationary tank is surrounded by a rigid outer container.
- 20 6. Bioreactor according to claims 1 to 5, wherein the upper part of the tank is flared.
7. Bioreactor according to claims 1 to 6, wherein the tank is cylindrical or has an oval cross section.
- 25 8. Use of bioreactor according to claims 1 to 7, wherein the cells are plant, animal cells or micro-organisms.
- 30 9. Use of bioreactor according to claims 1 to 8, wherein the cells are producing biomass cells, embryogenic plant cells, metabolites, secondary plant metabolites, and/or recombinant molecules.